A DOCPHOENIX

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File Wrapper Search Info

SEQREQ ____
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CDCHECK ____
Compact Disk Review Checklist

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/091,343	03/06/2002	Hideki Ichioka	1035-369	7043

23117 7590 12/08/2003

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EXAMINER	
CALEY, MICHAEL H	

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 12/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/091,343	ICHIOKA ET AL.	
	Examiner	Art Unit	
	Michael H. Caley	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 September 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-10, 14, 15, and 18-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamagishi et al. (U.S. Patent No. 6,466,294 "Yamagishi" in view of Nakahara (U.S. Patent Application Publication 2001/0022640).

Regarding claim 1, Yamagishi discloses a liquid crystal display device having:

a switching element substrate (Figure 2B element 1) having a plurality of switching elements (Figure 2B element 12);

a counter substrate (Figure 2B element 2) opposite to the switching elements substrate;

a liquid crystal layer (Figure 2B element 4) formed between the substrates;

a sealing section (Figures 1 and 2B element 3) provided so as to enclose a display area between the substrates for sealing liquid crystal of the liquid crystal layer;

a first signal wiring (Figure 1 element 5), provided on one of the substrates for controlling the switching elements;

a second signal wiring (Figure 1 element 8, Figure 2A elements 7 and 8), provided on the other substrate so as to be opposite to the first signal wiring for applying a voltage to the liquid crystal layer; and

at least one transfer section for electrically connecting the first signal wiring or the second signal wiring and the substrate opposite to the first signal wiring or the second signal wiring, wherein said transfer section comprises both first and second types of particles, said first type of particles (Figure 2B element 9) in said transfer section being conductive and having greater flexibility than said second type of particles (Figure 2B element 11) in said transfer section, so that said first type of particles in said transfer section is for electrically connecting the first signal wiring or the second signal wiring and the substrate opposite to the first signal wiring or the second signal wiring, and said second type of particles is for spacing the substrates from one another (Column 4 lines 6-16).

Yamagishi discloses all of the proposed limitations except for the first type of particle as having a greater size than the second type of particle. Yamagishi discloses the first type of particle as having a larger diameter than the second type of particle, exhibiting the same compression characteristic as proposed by Applicant (Column 5 lines 53-60). The first type of particle is smaller than the second type of particle given that the second particle is disclose by Yamagishi as a cylinder. Yamagishi, however, also teaches the use of glass spheres as the second type of particle or a cylindrical conducting particle (Column 6 lines 21-31). In such a case, the first type of particle would have a greater flexibility and greater size than the second type of particle. Such use of spherical glass particles as spacers within a seal is old and well known in the art. As taught by Nakahara, such glass spheres may be combined with conducting particles within a seal to construct a seal having conducting contacts between the substrates

while maintaining a spacing distance (Page 1 [0006], Page 4 [0036]; Figure 2 elements 131 and 132).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used glass spheres as the first spacing particle as proposed in which the first type of particle has a greater flexibility and greater size than the second type of particle. One would have been motivated to provide such a seal particle configuration in order to provide a seal having both spacing and conducting capabilities in order to benefit from a display device having a larger display area while having a smaller size as taught by Nakamura (Page 1 [0009]). It would have been an engineering expediency to have used spacing spheres instead of spacing cylinders in order to take advantage of the expected results of such a choice for a spacing particle as are old and well known in the art.

Regarding claim 2, Yamagishi discloses an input terminal of the first signal wiring and an input terminal of the second signal wiring as provided on one of the substrates (Figure 1 elements 5, 5a, and 8).

Regarding claims 3 and 4, Yamagishi discloses a transfer section as proposed in which contact pads are provided on both substrates with connections to their respective wirings having electrical connections through the conductive particles (Figures 1 and 2A elements 5, 5a, 6, and 8).

Regarding claim 5 and 6, Yamagishi discloses the first and second contact pads as having substantially a same resistance (Column 4 lines 29-30, 58-60).

Regarding claims 7-10, Yamagishi discloses a substrate (Figure 1 element 5) with an external connection to a signal generator which supplies the signal to the opposite substrate via the electroconductive seal member.

Regarding claims 14 and 15, Yamagishi discloses the first substrate as the switching element substrate having the switching elements (Figure 2B elements 1 and 12).

Regarding claim 18 and 19, Yamagishi discloses an insulation film having an opening as formed on at least one of the substrates, and the first contact pad or the second contact pad as provided in the opening (Figure 2A elements 5a, 6, and 10).

Regarding claim 20, Yamagishi discloses the conductive particles as having elasticity (Column 5 lines 53-60).

Regarding claim 21, Yamagishi discloses the conductive particles as having round shapes and diameters which are greater than a cell thickness of the sealing section (Column 5 lines 53-60).

Regarding claim 22, Yamagishi fails to explicitly detail a distance of 50 microns or more between the particle position and an interface between the liquid crystal layer and the sealing section. The Examiner takes Official notice, however, that applications involving a sealing member with conductive particles include such a distance as is mandatory for the proper functionality of the liquid crystal display.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have constructed the seal such that the particles would be at least 50 microns from the interface. Such a design constraint would have been necessary in order to avoid unwanted fields applied to the liquid crystal layer through the transfer section. One would have been motivated to maintain such a separation in Yamagishi's device in order to avoid unwanted effects to the liquid crystal from leakage through the transfer section.

Regarding claim 23, Yamagishi discloses the conductive particles as coated with a conductive material (Column 4 lines 9-11).

Regarding claim 24, Yamagishi discloses the transfer sections as provided alternately along both edges of a width in the sealing section (Figure 1), and a width of the second signal wiring as narrower than that of the second contact pad (Figure 1 elements 6 and 8).

Regarding claim 25, Yamagishi discloses the first type of particles as formed by coating respective surfaces of elastic particles with a conductive material, and the second type of particles comprises glass fiber (Column 4 lines 6-16).

Regarding claim 26, Yamagishi discloses the sealing section as formed by mixing the first and second particles into a thermosetting material in predetermined proportions (Column 4 lines 6-16, Column 5 lines 40-52).

Regarding claim 27, Yamagishi discloses a device resulting from the process in which the sealing section is formed by applying a thermosetting material, to which said first and second types of particles are mixed, on one of the substrates, said one of the substrates as mated to the other of the substrates, and these mated substrates are pressurized at a pressure for deforming the first type of particles so that the first type of particles is deformed to a thickness approximately equal to a cell thickness defined by the second type of particles (Column 5 line 40 to Column 6 line 13).

Regarding claim 28, Yamagishi discloses the at least one transfer section as having a staggered structure (Figure 1 element 8).

Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamagishi in view of Sakamoto et al. (U.S. Patent No. 6,366,331 "Sakamoto").

Yamagishi discloses all of the proposed limitations except for the mean distribution volume of the conductive particles. Sakamoto, however, discloses a density of conductive particles within a conductive sealing member functioning as a transfer section for a liquid crystal display which fits within the proposed limitation (Column 7 lines 29-32).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have tailored the transfer section disclosed by Yamagishi such that the distribution of conductive particles would fall within the proposed range. As is old and well known in the art the preferred density of the particles depends largely on the size of the particles within the sealing medium. One would have been motivated to adjust the density of the particles to within the proposed range when using particles of a given size so that the optimal conductivity of the medium between plates may occur. Such a choice for the density would have been an engineering expediency to accommodate for the size of the particle used or available and the desired conductivity of the connection.

Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamagishi in view of Burrell et al. (U.S. Patent No. 5,680,192 "Burrell").

Yamagishi fails to disclose the input terminal of the first signal wiring and the input terminal of the second signal wiring as made of a conductive material whose resistsnce is smaller than that of the first signal wiring or the second signal wiring. Burrell, however, teaches a minimum area for the seal connector corresponding with a maximum allowed resistance (Column 5 lines 60-67, Column 6 lines 1-15; Column 7 lines 39-46). The Examiner takes Official notice that contacts such as pads typically have a larger cross-sectional area than a signal wiring section, giving the wiring section a higher resistance that that of the pad.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have constructed the pads and the wiring such that the input terminals had a lower resistance than that of the wiring. Such a design would have incorporated methodologies old and

well known in the art of achieving a fault-free device having conducting and highly reliable connections. One would have been motivated to construct the pads and the wiring to such a specification to allow for the smallest possible implementation of the electrical connections while realizing a reliable and functional device.

Response to Arguments

Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.